



14 October 2016

Hd AAA (through Mgr AR)

HEBRIDES D701 POST IMPLEMENTATION REVIEW

1. Introduction

1.1 Approval was given by the Safety and Airspace Regulation Group (SARG) for the Ministry of Defence (MoD) to proceed with the implementation of a revised Danger Area (DA) EG D701 complex. The aim was to amend the DA complex in order to safely accommodate current and future weapons systems tests within its boundaries, minimising the requirement to reserve additional airspace by Notice to Airman (NOTAM). The modified EG D701 complex came into effect on 5 February 2015. In accordance with Stage 7 of the Airspace Change Process (ACP) as detailed in Civil Aviation Publication (CAP) 725, a Post Implement Review (PIR) should be conducted to provide a rigorous assessment by the regulator to determine if the impacts and benefits set out in the original proposal have actually been delivered or not, to ascertain why and determine the most appropriate course of action as necessary.

2. Background

2.1 The Hebrides Range is operated by QinetiQ on behalf of MoD, and was established to allow hazardous activities to take place within airspace reserved for that purpose. The range is used for a variety of tasks including short, medium and long-range munitions, and over the years has evolved to cater for the testing and evaluation of modern weapons systems. Primarily to accommodate the larger safety traces associated with modern weapons systems, the range required additional airspace. Originally promulgated via NOTAM and Notice to Mariners on an ad hoc temporary basis, this was not considered a satisfactory long term solution by the Civil Aviation Authority (CAA) and consequently an ACP to formalise these arrangements was submitted by MoD.

3. Key Objectives

3.1 The ACP looked to create a DA sized to cover the existing extensions promulgated by NOTAM. The aim was not to gain more airspace but to regularise existing practices which support activities taking place within the range. The proposed design was subdivided into several smaller areas, allowing a bespoke shape and size to be activated for each weapons trial which is as small as safely possible, thereby ensuring the most efficient and flexible use of the airspace.

3.2 By creating a DA with bookable sections rather than using NOTAMs, the notified activations can be fully integrated into the systems and processes used by the UK Airspace Management Cell (AMC) and the Eurocontrol Network Manager. This allows the DA activity to be seen by airlines in advance, enabling harmonised and dynamic planning of the air traffic network.

- 3.3 In order to minimise disruption to airspace users on North Atlantic routes, specifically the impact on Oceanic Entry Points (OEPs), the old method of activation via NOTAM required close coordination between the Range and National Air Traffic Services (NATS). To complement the airspace design the existing Letter of Agreement (LoA) between NATS, AMC, CAA, MoD and QinetiQ was updated to include a new protocol defining the conditions of use of the range airspace, allowing UK and European airspace planners to coordinate more efficiently. In addition new OEPs were incorporated into the design.

4. Air Traffic Management Requirements

- 4.1 The change in design of EG D701 is not associated with an increase in intensity, mix or activity type, therefore the current manpower provision is deemed acceptable and there should be nil impact on safety from a manpower perspective.

- 4.2 The modification is designed to ensure that all activities are contained within a danger area. This has enabled these defined areas to be built into the AMC and Eurocontrol systems, which has facilitated full integration into the flight planning process. This has created significant efficiencies in the use of airspace. Airspace Managers stated that:

“they can now plan routes/tracks more effectively in shorter time periods thereby increasing capacity and reducing delays with the subsequent economic benefits. The AMC is now able to react to changing airspace requirements through publication of Updated Use Plans (UUP)...ensuring in most cases that fuel uplift by airlines matches the best route/track available.”

- 4.3 Range bookings are managed and coordinated using an AMC-7 process whereby the Airspace Managers manually input data onto an Excel spreadsheet.

- 4.4 Military Airspace Booking and Co-ordination Cell (MABCC), co-located at the AMC, coordinate the bookings for EG D701. The additional workload is negligible, and the oversight role assists in ensuring there is no coincident DA or Managed Danger Area (MDA) activity which imposes unacceptable restrictions on Commercial Air Transport (CAT), which has occurred in the past.

5. Areas of Contention

- 5.1 Airspace Regulation notified the PIR on the CAA website and via SkyWise under airspace and airspace change alerts. The views of all those within the aviation industry who may wish to comment were invited, as this forms an important part of the review in determining if the anticipated benefits of the airspace change had materialised. A comprehensive response was received from NATS which included some areas of contention.

- 5.2 **Size.** A disadvantage of predefined DA boundaries as opposed to NOTAM'ed areas for individual trials/firings is that there is the potential for more airspace to be booked than is required. Evidence exists of this occurring in one particular area which has the knock-on effect of closing more OEPs than previously affected. This issue was discussed by all stakeholders including NATS at the EG D701 Focus Group Meeting Five. An option to mitigate this is to create many more subdivisions within each area; however, it was considered that this would make the areas too complex to manage effectively. NATS also stated that an increase in internal subdivisions could have a negative impact on the workload of their staff.

- 5.3 It was highlighted that there were occasions when EG D701A was activated with D701C, yet the adjacent area of D701B was not. At these times only a small element of D701C is actually used. Therefore, notwithstanding the comments above, NATS recommend that subdividing D701C should be investigated in order to improve airspace efficiency in this area.
- 5.4 **D701Z.** D701Z encompasses Benbecula Airport and was not altered during the ACP. However, when initiating the activation process in July 2015, it was discovered that the UK Aeronautical Information Publication (AIP) had prescribed notified hours of operation for EG D701Z as; “*when notified Mon-Fri 1630-SS and Sat 1300-SS Winter (Summer 1hr earlier)*”. These timings proved too restrictive for the trial, and the CAA granted a dispensation on this occasion. It later transpired that the published timings were a legacy restriction to deconflict scheduled airport movements. An updated LoA between the Range and airport ensures the interests of the airport and scheduled flights are protected along with any other priority flights.
- 5.5 **OEP/10W NOTA Points.** The maximum number of days per year that specific numbers of OEPs/10W Northern Oceanic Transition Area (NOTA) points can be closed is defined in the main LoA. On occasion owing to traffic flow requirements the AMC has negotiated a later start time for range activity, for example 1300 UTC. The MoD considers itself to be at a disadvantage under these circumstances, as activity affecting OEPs/10W NOTA points after 1400 UTC is not counted in the ‘maximum number of days’ total, therefore the use of the range which closes these points for one hour is being counted as a whole day. Whilst the MoD preferred solution was to calculate usage on an hourly basis, this was deemed too difficult to manage and disadvantaging ANSPs. A compromise of counting closures of ‘less than two hours’ as a half day was also discounted.
- 5.6 **AMC-7 Forms.** Both the Irish Aviation Authority and QinetiQ range staff have highlighted difficulties associated with accessing the AMC-7 process, in particular via the NATS system. This area reservation tool is Excel based and requires manual input from Airspace Managers. The additional areas created in the ACP have increased the data exchange required to effectively manage the new airspace. Mitigated by utilising the MABCC for oversight and coordination of the bookings, this process is extremely inefficient.

6. Environmental Conclusions

- 6.1 The ACP has not created any additional activities, thus there is no change in this regard.
- 6.2 In regularising the airspace used by the range, the ACP has created a published volume of airspace that could potentially cause some airspace users to reschedule flights around it. Whilst acknowledging that this is not a new airspace construct as there is no new additional airspace, in this scenario there could be potential knock on environmental impacts. However, being both remote and located over the sea, it is the view of Airspace Regulation that this occurrence would be highly infrequent. In addition, the overwhelming majority of airspace users in this location are CAT. By integrating the airspace design into the flight planning process, fuel uptake can be potentially reduced and routes more efficiently used than before. Whilst exceptionally difficult to capture the true saving and hence impact, this should be seen as neutral at worst.

7. Effectiveness of Change

- 7.1 The airspace change has ensured that the practices to support in-service firings and DE&S trials have been regularised such that all activities are contained within defined DAs. Whilst there are a few occasions when defined DAs use more airspace for a trial/firing than a specific NOTAM'ed area, the use of smaller subdivided areas within the range which have the associated mechanisms to turn on/off the airspace allows for a greater utilisation of airspace. The notified activations can now be fully integrated into the systems and processes used by the UK AMC and Eurocontrol Network Manager, enabling harmonised and dynamic planning of the air traffic network, and more efficient use of the airspace. These benefits far outweigh the potentially smaller size of a specific NOTAM'ed area.
- 7.2 There have been 30 in-service firings and DE&S sponsored trials in the range since the introduction of the airspace change in February 2015, all of which have been safely contained within the new airspace structure.
- 7.3 One objective was to minimise disruption to airspace users on North Atlantic routes, especially the impact on OEPs. The subdivision of D701A, specifically the redesign of the western boundary enabling potential access to OEP 'ERAKA,' has been effective. Since the ACP was established there have been 15 activities which would have previously closed OEP 'ERAKA,' but instead access was achieved.

8. Other Benefits

- 8.1 The consultation phase led to engagement with several stakeholders who highlighted a lack of communication or confusion in certain parts, regarding activation or status of the DA. Now rectified, these are not direct benefits of the ACP itself, but have led to enhanced situational awareness and safer procedures.
- 8.2 Prior to the ACP it became apparent that the Royal Navy submarine force was not receiving notification of all trials where ordnance was entering the water. Whilst resolving this, further engagement led to a redesign of the Hebrides DA internal boundaries to align with Royal Navy submarine exercise areas, to reduce the impact when specific DA sections are active.

9. Operational Impact

- 9.1 An LoA was put in place between various elements of NATS, MoD, Irish Aviation Authority (IAA) and Shannon En-Route Services to ensure the appropriate airspace sharing arrangements, coordination and notification of DA activity. The LoA was reviewed after 6 and 12 months with the signatories and refined as required, and is now subject to annual review.
- 9.2 The notification, agreement and cancellation protocols for range activities are detailed within the LoA, and are the basis for ensuring the most efficient use of airspace. It has been designed to attempt to minimise operational impact, in particular on peak westbound traffic flow, where if activated the range may impact the most optimum routes depending on the location of the North Atlantic jet streams. To date the procedures appear to work well to the satisfaction of all parties, although the notification process using the Form AMC-7 could be significantly improved by using an automated ASM booking tool.

10. Airspace Regulation Issues and Recommendations for Refinement

10.1 D701Z AIP Times

10.1.1 The special procedures for activating D701Z are contained within the Highland and Islands Airports Ltd (HIAL)/QinetiQ/NATS LoA. This ensures the interests of Benbecula airport are protected and scheduled flights are not affected as the airport retains primacy. To facilitate range operations around this and reflect current operations such as RPAS departing from at/in the vicinity of the airport, the AIP published hours for D701Z should be updated to read 'as notified'.

10.1.2 Following discussions with the sponsor who are keen to facilitate this change, a formal AIP Change Request should be submitted by them to Airspace Regulation as soon as practicable.

10.2 AMC-7 Form

10.2.1 Both the IAA and QinetiQ have raised issues with the AMC-7 Form, which provides a common reference point leading to agreeing airspace bookings and status. Owing to the increased data exchange required which is a direct consequence of increasing the number of areas, the process is wholly inefficient for managing a complex range. To effectively manage the new airspace and seamlessly integrate with the AMC it is highly recommended that a new ASM tool, such as LARA, is introduced. This would be required at the range, NATS PC, and Shannon to most effectively data share and manage the airspace efficiently. In addition to greatly enhancing the efficiency of dissemination of information, it will enable airspace to be released more expeditiously benefiting all airspace users, and enhance flight safety.

10.2.2 Maintaining this legacy management system in the long term is not acceptable. The sponsor states that LARA is their preferred choice of future ASM tool. It is strongly recommended that this is vigorously pursued, and an update on progress is required after 6 months of this report. If LARA is not forthcoming, then an alternate more efficient system is to be obtained to replace the AMC-7 process. It is anticipated this should be in place within a year of this report.

10.3 D701C subdivision

10.3.1 To improve airspace efficiency on the occasions when both D701A and D701C are activated together without D701B, it is recommended that D701C is subdivided as only a small element of it is actually used.

10.3.1 To facilitate an enhancement to FUA a formal change request should be submitted by the sponsor to AR as soon as practicable. The proposed WGS64 lat/long data will be checked by the CAA and submitted to AIS.

10.4 Statistics

10.4.1 A condition for authorisation in the original CAA decision letter included the recording of statistics. In addition to the number of days and altitude of activation for each segment of the DA and number of affected OEPs, instances where D701X is active when D701O is not, owing to the potential impact on OEP AGORI, are to be continued to be recorded. These statistics are to be held by the sponsor if required in the future.

10.5 OEP/10W NOTA Points

- 10.5.1 The number of days that specific OEPs/10W NOTA points can be closed is detailed in the LoA. Owing to the impact on MoD usage days when late starts are requested and approved by civil, the total number of days where points are closed is to be recorded. In addition the number of events impacted by 'late start requests' are to be recorded. This should be monitored and subject to annual review to ensure MoD is not disadvantaged.

11. Conclusions

11.1 Stakeholder Conclusions

- 11.1.1 All stakeholders were represented at Focus Group Meeting Five and the twelve month review. Here all members agreed that the aim of the ACP had been met, and that consequential benefits had occurred as a result. Matters arising were discussed, and whilst some are on-going these are captured in the recommendations of the PIR.

11.2 Regulatory Conclusions

- 11.2.1 Airspace Regulation believes the proposed DA redesign can be safely adopted, maintaining a high standard of safety in the provision of air traffic services, in accordance with the CAA's primary statutory duty set out in Section 70(1) of the Transport Act 2000. The redesign conforms to the CAA's additional statutory obligations including to 'secure the most efficient use of airspace consistent with the safe operation of aircraft and expeditious flow of air traffic'. The CAA considers that the most efficient use of airspace is defined as:

"The most aircraft movements through a given volume of airspace over a period of time, in order to make best use of the limited resource of UK airspace from a whole system perspective."

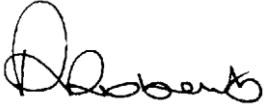
- 11.2.2 In addition it is designed to 'satisfy the requirements of all airspace users', and 'facilitate the integrated operation of air traffic services provided by or on behalf of the armed forces of the Crown and other air traffic services'¹. The revised danger area is appropriate for the operations contained within it, yet no larger, and is the least complex design whilst retaining flexibility and efficiency. By establishing a danger area which is fully regularised and the areas integrated into the flight planning process' and depicted on general aviation charts, enables optimum routing for both CAT and GAT, thereby satisfying the requirements of all operators. Maintaining the current DA activity levels and locations ensures that there is no change to the environmental or third party impact or risk. Establishing an LoA which protects the interests of Benbecula airport meets the requirements of interested parties, with no negative impact foreseen on current commercial operations.
- 11.2.3 From the data provided the ACP is fully justified and balances and serves the needs of all airspace users. There are still options for improvement, as detailed in section 10 of this report, however the procedures and redesigned airspace should continue as implemented subject to the recommendations being adopted.

¹ Transport Act 2000, Section 70(2)

Case Officer:

Sean Garner
Airspace Regulator

Signed off by:

A handwritten signature in black ink, appearing to read 'Phil Roberts', with a large, stylized initial 'P'.

Phil Roberts
Head of Airspace, ATM and Aerodromes

Annex:

A. EG D701 Hebrides Range

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